

CLAIMS

1. A dense mortar which comprises:

- 5 (i) an ettringite binder comprising calcium sulphates and a calcium aluminates mineral compound, the calcium aluminates mineral compound comprising oxides of calcium C and of aluminium A, which are soluble and combined in one or several crystallized and/or amorphous mineralogical phases in such proportions that:
- 10 - the useful C/A molar ratio of the calcium aluminates mineral compound is in the range of 1.2 to 2.7;
- the sum in weight of the useful (C+A) phases represents at least 30% of the total weight of the mineral compound,
- (ii) at least one poly(alkylene oxide) comb polymer (PCP) and,
- (iii) at least one structuring organic resin,
- 15 characterised in that the mortar contains less than 2% by weight of said structuring organic resin.

2. A dense mortar according to claim 1, characterised in that it the mortar comprises at least 0.3% by weight of structuring organic resin,

20 based on the weight of the mortar.

3. A dense mortar according to claims 1 or 2, characterised in that the mortar comprises 0.05% to 0.3% of poly(alkylene oxide) comb polymer (PCP), preferably, 0.1% to 0.2% of poly(alkylene oxide) comb polymer

25 (PCP); based on the weight of the mortar.

4. A dense mortar according to any one of the claims 1 to 3, characterised in that said structuring organic resin account for 1% by weight of the mortar, or less.

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5. A dense mortar according to any one of the claims 1 to 4 characterised in that the poly(alkylene oxide) comb polymer (PCP) is chosen from among the copolymers of carboxylic acids and carboxylic esters of poly(alkylene glycol), copolymers of carboxylic acids and

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poly(alkylene glycol) imide, copolymers of carboxylic acids and vinylic ethers of poly(alkylene glycol), either neutralised or not neutralised, and mixtures of thereof.

- 5 6. A dense mortar according to any one of the claims 1 to 5 characterised in that the structuring organic resin comprises at least one polymer selected from among poly(vinyl acetate), powdered copolymers of vinyl and ethylene acetate (EVA), copolymers formed by copolymerisation of 2 or more monomers selected from among ethylene, vinyl acetate, vinyl
10 esters of versatic acids, vinyl chloride, vinyl laurate, styrene, butadiene, alkyl acrylate, alkyl methacrylate, maleic anhydride and its derivatives.

7. A dense mortar according to claim 6 characterised in that it comprises 0.2% by weight of the mortar, of at least one poly(alkylene
15 oxide) comb polymer (PCP) and 1% by weight of the mortar of at least one powdered copolymer of vinyl and ethylene acetate (EVA).

8. A dense mortar according to any one of the claims 1 to 5 characterised in that the structuring organic resin comprises at least one
20 polyvinyl alcohol (PVA), possibly altered by the inclusion of carboxylic acid groups in its structure.

9. A dense mortar according to claim 8 characterised in that it comprises 0.2% by weight of the mortar, of at least one poly(alkylene
25 oxide) comb polymer (PCP) and 1% by weight of mortar of at least one polyvinyl alcohol (PVA).

10. A dense mortar according to any one of the claims 1 to 9 characterised in that the weight ratio of calcium aluminates mineral
30 compound /calcium sulphate within the ettringite binder is comprised between 0.5 and 4, and preferably between 1.5 and 3.

11. A dense mortar according to any one of the claims 1 to 10 characterised in that the molar ratio of calcium sulphate/aluminium oxide
35 A in the ettringite binder is comprised between 0.5 and 2.

12. A dense mortar according to any one of the claims 1 to 11 characterised in that the molar ratio of useful mineral compound calcium aluminates/calcium sulphate within the ettringite binder is comprised between 1.3 and 2.5, and preferably between 1.6 and 2.

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13. A dense mortar according to any one of the claims 1 to 12 characterised in that the useful C/A molar ratio of the calcium aluminates mineral compound in the ettringite binder is comprised between 0.6 and 1.8, and preferably between 0.8 and 1.7.

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14. A dense mortar according to any one of the claims 1 to 13 characterised in that it exhibits at the time of mixing with water a water/solids weight ratio lower than 0.5.

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15. A dense mortar according to any one of the claims 1 to 14, characterised in that it does not comprises any Portland cement or hydraulic lime, or comprises Portland cement and/or hydraulic lime at a content of less than 3.5% by weight based on the total weight of dry mortar.

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16. A dense mortar according to any one of the claims 1 to 15, characterised in that the sum in weight of useful (C+A) phases accounts for at least 50% by weight of the total weight of the calcium aluminates mineral compound.

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17. A dense mortar according to any one of the claims 1 to 16, characterised in that the calcium aluminates mineral compound is obtained through baking in a furnace at a temperature of over 1100°C, in the form of one or several melted or sintered clinkers that may contain crystallised phases or amorphous phases.

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18. A dense mortar according to any one of the claims 1 to 17, characterised in that the calcium aluminates mineral compound is under the form of a crystallised mineralogical phase selected from among CA, C12A7, C3A, C4A3\$ or under the form of an amorphous phase or under

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the form of a mixture of at least one of said crystallised mineralogical phases and an amorphous phase.

19. A dense mortar according to the claim 18 characterised in that
5 the calcium aluminates mineral compound contains at least 30% by weight of C12A7, preferably at least 50% by weight of C12A7, more preferably from 50% to 85% by weight of C12A7 based on the total weight of the mineral compound.

10 20. A dense mortar according to any one of the claims 1 to 19 characterised in that the calcium aluminates mineral compound contains at least one crystallised mineralogical phase selected from among C2A(1-x)Fx, C2S, C2AS, C3S and mixtures thereof, where x is an integer belonging to]0; 1].

15 21. A dense mortar according to any one of the claims 1 to 20 characterised in that the calcium aluminates mineral compound is ground and exhibits a Blaine surface area greater than or equal to 1500 cm²/g.

20 22. A dense mortar according to the claim 21 characterised in that the calcium aluminates mineral compound is ground to a Blaine surface area comprised between 2000 cm²/g and 5000 cm²/g.

25 23. A dense mortar according to any one of the claims 1 to 22, characterised in that the calcium sulphate is derived from a compound selected from among anhydrites, semi-hydrates, gypsum and mixtures thereof.

30 24. A dense mortar according to one of the claims 1 to 23, characterised in that it comprises furthermore:

-chalk fillers or siliceous sands: from 25 to 85% by weight based on the total weight of the dry mortar,

- lime and/or Portland cement: from 0% to 3.5% by weight based on the total weight of the dry mortar, and

- complementary rheological additives and/or setting regulating additives.

5 25. A dense mortar according to claim 24, characterised in that it contains:

- chalk fillers or siliceous sands: from 50 to 80% by weight based on the total weight of the dry mortar,

- lime and/or Portland cement: from 0% to 0.5% by weight based on the total weight of the dry mortar, and

10 - complementary rheological additives and/or setting regulating additives.

15 26. A dense mortar according to the claims 24 or 25 characterised in that the rheological additives account for from 0.1% to 0.5% of the total weight of the dry mortar, and the setting regulating additives account for 0.1% to 0.5% of the total weight of the dry mortar.

20 27. A dense mortar according to any one of the claims 1 to 26 characterised in that it is obtained by mixing with water in a quantity such that the water/solid weight ratio is less than 0.5.

28. The use of a poly(alkylene oxide) comb polymer (PCP) for the formulation of a mortar according to any one of the claims 1 to 27.